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KENYON & KENYON LLP			YAMNITZKY, MARIE ROSE	
ONE BROADWAY			ART UNIT	
NEW YORK, NY 10004			PAPER NUMBER	

1774

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/807,738

Applicant(s)

THOMPSON ET AL.

Examiner

Marie R. Yamnitzky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-88 is/are pending in the application.
- 4a) Of the above claim(s) 17-19, 23-27, 53-55, 59-63 and 79-81 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 15, 16, 20-22, 28-52, 56-58, 64-78 and 82-88 is/are rejected.
- 7) ☒ Claim(s) 9-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date rec'd 27 Jul 2004 and 19 Oct 2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

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1. The preliminary amendment received August 06, 2004, which amends paragraphs [0027], [0029] and [0032], provides a new abstract, and amends claims 4, 9-14, 19, 29-32, 34-36, 40, 45-50, 55, 60, 66-68, 70-72, 75, 81 and 83-85, has been entered.

The amendment received July 24, 2006, which adds claims 87 and 88, has been entered. Applicant states that the new claims are supported by paragraph [0066] on page 22 of the specification. Paragraph [0066] is on page 29. New claims 87 and 88 are supported by paragraph [0061] on page 22.

Claims 1-88 are pending.

2. Applicant's election without traverse in the reply filed on July 24, 2006 is acknowledged. Applicant elects the species wherein the compound comprises more than one ligand, at least one ligand is ligand (I) (a ligand having the structure shown in the first formula on p. 20 of the specification), at least one ligand is ligand (XVIII) (a ligand other than one having the structure shown in the first formula on page 20 or the structure shown in any of the formulae shown on pages 25 and 28 of the specification), and the metal is iridium.

As the ultimate species, applicant selects the compound of the last formula shown on page 20 of the specification.

Claims 1-16, 20-22, 28-52, 56-58, 64-78 and 82-88 read on the elected species. This list of claims differs from the list of claims considered by applicant to read on the elected species. The examiner does not consider claims 17-19, 53-55 and 79-81 to read on the elected species

because applicant did not elect ligand (XVII), or any of ligands (II)-(XVI). However, claims drawn to non-elected species will be considered upon allowance of a generic or linking claim.

3. Claims 17-19, 23-27, 53-55, 59-63 and 79-81 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on July 24, 2006.

4. Although some prior art is applied against non-elected species in this Office action, this action does not represent an examination on the merits of all non-elected species within the scope of the rejected claims.

5. Claims 30, 34, 66 and 70 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 30, 34, 66 and 70 require the first ligand to have a triplet energy corresponding to a wavelength less than 480 nm, and depend from claims which require the first ligand to have a triplet energy corresponding to a wavelength that is at least 80 nm greater than the wavelength corresponding to the triplet energy of other ligand(s) bound to the metal. Accordingly claims 30, 34, 66 and 70 also require at least one ligand having a triplet energy corresponding to a

wavelength less than 400 nm. The specification does not provide any suggestion of ligands that have a triplet energy corresponding to a wavelength less than 400 nm.

6. Claims 1-8, 15, 16, 20-22, 37-52, 56-58, 64-78 and 82-88 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-8, 15, 16, 20-22, 37-44, 51, 52, 56-58, 74-78 and 82-88: The R variables are not fully defined when R is a group that contains R (i.e. when R is CO_2R , C(O)R , NR_2 or OR).

Claims 15, 16, 51, 52, 77 and 78: The compound defined in the independent claims from which these claims depend does not have a substituent group if each of the R variables is hydrogen and, in the case of claims 15, 16, 51 and 52, the (C-N) ligand is an unsubstituted cyclometallated ligand. It is not clear if claims 15, 16, 51, 52, 77 and 78 are limiting the compound to one comprising a substituent group specified in these claims, or if claims 15, 16, 51, 52, 77 and 78 are merely further defining an option.

Claims 21 and 57: The requirement for at least one ligand that is a phosphorescent emissive ligand at room temperature and one that is not a phosphorescent emissive ligand at room temperature renders claims 21 and 57 indefinite. In view of paragraph [0067], whether a specific ligand is a phosphorescent emissive ligand at room temperature in a specific compound depends upon the identity of the other ligand(s) in the compound. A specific ligand may meet the limitations of a phosphorescent emissive ligand at room temperature in one compound having the structure set forth in present claim 1, but the same ligand may meet the limitations of

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a ligand that is not a phosphorescent emissive ligand at room temperature in another compound having the structure set forth in present claim 1. Since the emissive limitations recited in claims 21 and 57 are not inherent in specific ligands, per se, the limitations are indefinite.

Claims 37-52, 56-58, 64-78 and 82-86: The use of the term “further” in the fifth line of claims 37, 64, 69 and 74 is confusing. It is not clear what the emissive layer must comprise in addition to the specified compound.

Claims 84 and 85: Proper antecedent basis is lacking for “the first ligand”. These claims depend from claim 74, which only recites “a ligand”.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 15, 16, 20, 21, 37-39, 51, 52, 56, 57, 74, 77, 78, 82, 84 and 86-88 are rejected under 35 U.S.C. 102(b) as being anticipated by Igarashi et al. (US 2001/0019782 A1).

See the whole publication. In particular, see paragraph [0002], the compounds represented by formulae (1-20), (1-28), (1-36) and (1-41) on pages 12-14, and paragraphs [0135], [0137], [0159], [0162] and [0163].

Each of Igarashi's compounds of formulae (1-20), (1-28), (1-36) and (1-41) is a compound having the structure defined in present claims 74 and 87, and meets the limitations recited in claim 82. Each is disclosed for use in the emissive layer of a device as defined in present claims 74 and 88. Igarashi's devices of Examples 5, 8 and 9 (paragraphs [0159], [0162] and [0163]) meet the limitations of the device of claims 74 and 88, and various claims dependent from claim 74.

Each of Igarashi's compounds of formulae (1-28) and (1-41) is also a compound having the structure defined in present claims 1 and 37, and meets the limitations recited in present claims 20 and 56. Igarashi's device of Example 9 meets the limitations of the device of claim 37 and various claims dependent therefrom.

The compound of formula (1-41) further meets the limitations recited in present claims 2, 3, 38 and 39.

The compounds of formulae (1-28) and (1-41) further meet the limitations recited in present claims 15, 16, 51, 52, 77 and 78 if these claims are merely further defining an option. The compound of formula (1-20) also meets the limitations recited in present claims 77 and 78 if these claims are merely further defining an option.

The compound of formula (1-41) is considered by the examiner to further meet the limitations recited in present claims 21 and 57 in light of paragraph [0067] of the present

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specification and noting the difference in λ_{max} of the devices of Igarashi's Examples 5 and 9. Example 5 utilizes the compound of formula (1-20) which has three unsubstituted phenylpyrazole ligands, and the device has a λ_{max} of 547 nm. Example 9 utilizes the compound of formula (1-41) which has two unsubstituted phenylpyrazole ligands and an unsubstituted phenylpyridine ligand, and the device has a λ_{max} of 513 nm. Accordingly, the λ_{max} for Example 9 is apparently attributable to the phenylpyridine ligand, such that the compound of formula (1-41) has one ligand that is emissive at room temperature and two ligands that are not emissive at room temperature as those limitations are used by applicant in the context of claims 21 and 57.

In view of the λ_{max} of the devices of Igarashi's Examples 5, 8 and 9, at least the substituted phenylpyrazole ligands of the compound of formula (1-36) and the unsubstituted phenylpyridine ligand of the compound of formula (1-41) have a triplet energy meeting the limitation recited in present claim 84.

9. Claims 74, 82, 83 and 86 are rejected under 35 U.S.C. 102(a) and 35 U.S.C. 102(e) as being anticipated by Lamansky et al. (US 2002/0182441 A1).

See the whole publication. In particular, see Figures 5d, 7r, 8c, and claims 3, 6 and 29. An emissive phosphorescent organometallic compound comprising at least one ligand represented by the first formula in Figure 5d, such as the emissive compound of the formula shown in Figure 7r, meets the limitations of the compound required for the device of present claims 74, 82, 83 and 86. Lamansky's compounds are disclosed for use in the emissive layer of

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an organic light emitting device comprising an anode, a cathode and an emissive layer between the anode and cathode.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 15, 16, 28, 29, 31-33, 35, 36, 51, 52, 64, 65, 67-69, 71-73, 77, 78 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. (US 2001/0019782 A1) as applied to claims 1-3, 15, 16, 20, 21, 37-39, 51, 52, 56, 57, 74, 77, 78, 82, 84 and 86-88 above, and for the further reasons set forth below.

With respect to claims 15 and 16, and similar claims, if the substituent group recited in these claims is a requirement rather than an option, the compounds referenced above in regard to these claims do not anticipate the recited substituent group. However, Igarashi et al. teach that the compounds may be substituted with substituents. Phenyl, naphthyl and pyridyl groups are all disclosed as possible substituents (e.g. see paragraph [0050]), and phenyl and naphthyl groups meet the preferred aryl substituents (e.g. see paragraphs [0053], [0059] and [0060]). Absent a showing of superior/unexpected results commensurate in scope with the rejected claims, it is the examiner's position that it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make compounds similar in structure to specific compounds

disclosed by Igarashi et al., utilizing one or more of the disclosed substituents, in order to provide a variety of compounds suitable for the purposes of the prior art.

With respect to claims 28, 33, 64, 69 and claims dependent therefrom, which require ligands having triplet energies corresponding to wavelengths that are at least 80 nm different from each other, Igarashi et al. disclose different ligands which have triplet energies corresponding to a 80 nm or greater range of different wavelengths as evidenced by the λ_{max} values of the devices set forth in the Examples on pages 28-32. Further with respect to the rejected claims which require a ligand having a triplet energy corresponding to a wavelength of 500-520 nm, some of Igarashi's devices have a λ_{max} in the range of 500-520 nm. The iridium compounds used for the examples having a λ_{max} in the range of 500-520 nm necessarily have a ligand with a triplet energy corresponding to a wavelength of 500-520 nm. Further with respect to the rejected claims which require a ligand having a triplet energy corresponding to a wavelength greater than 590 nm, some of Igarashi's devices have a λ_{max} greater than 590 nm. The iridium compounds used for the examples having a λ_{max} greater than 590 nm necessarily have a ligand with a triplet energy corresponding to a wavelength greater than 590 nm. The prior art compounds may have two or more different ligands. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to utilize combinations of ligands selected from ligands demonstrated by Igarashi et al. to be useful in making emissive compounds that are suitable for use in an organic light emitting device.

12. Claims 75 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lamansky et al. (US 2002/0182441 A1) as applied to claims 74, 82, 83 and 86 above, and for the further reasons set forth below.

The ligand represented by the first formula in Figure 5d is a position isomer of the ligand required by present claims 75 and 76, having fluorine at present R₉ and R₁₀, and hydrogen at the other R positions. Given the ligands represented by the second and third formulae in Figure 5d, it would have been an obvious modification to one of ordinary skill in the art at the time of the invention to make and use a ligand similar to that represented by the first formula in Figure 5d, but having fluorine at present R₉ and R₁₁, and hydrogen at the other R positions. Further, one of ordinary skill in the art at the time of the invention would have reasonably expected that compounds that are similar in structure would have similar properties and could be used for the same purpose.

13. Miscellaneous:

The examiner suggests inserting --the compound-- before “having the structure” in the first line of claims 40 and 45-50 since the specified structure represents the compound.

Claims 15, 51 and 77: “naphthyl” should read --naphthyl--.

14. Claims 9-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 45-50 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

15. The reference made of record and not relied upon is considered pertinent to applicant's disclosure.

The article by Dedeian et al. in *Inorganic Chemistry* 44(13) anticipates applicant's elected species, including applicant's selected ultimate species (Dedeian's complex 7), but the article is not available as prior art.

16. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
October 15, 2006



MARIE YAMNITZKY
PRIMARY EXAMINER

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